Object Oriented Programming, Exercise 8

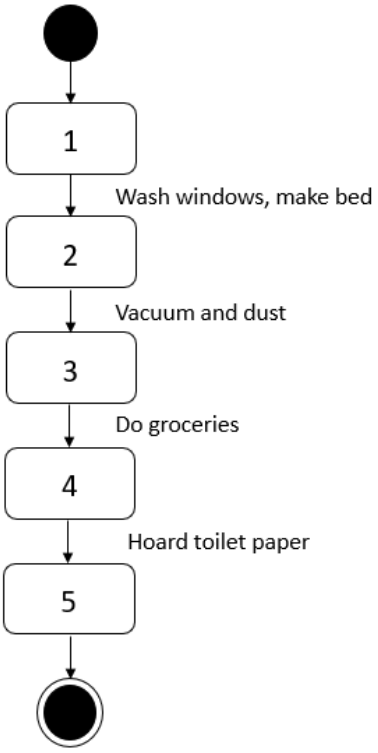
Topics: State diagrams and flow charts

Make a Git commit at least after every coding task.

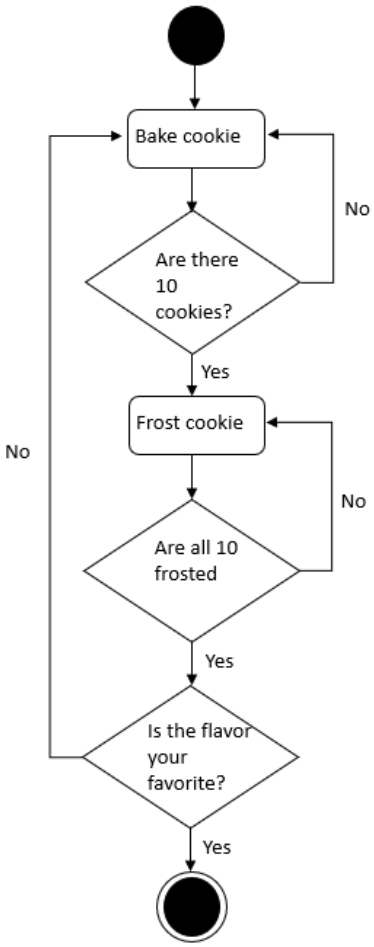
Code in Python3 and follow the style guide.

1. It is time to spring clean your house/flat. Your house/flat shall have floors, windows and surfaces that need cleaning and a bed that needs making. In addition, we shall prepare for the lockdown (fill the refrigerator and hoard toilet paper, as Finns usually do in crisis situations). **Implement the state diagram described below.** So, code a class (House or Flat) and have the necessary data attributes, setters, getters, init and str method. Then make an instance of the class (in main function) and start cleaning. House/flat can have any number of windows, rooms, etc. (as you wish, decide some reasonable amount, it does not really matter here). Instance can have different states like this:
    - State 1: windows dirty, floors dirty, bed unmade, surfaces dusty, fridge empty and toilet paper running out.
    - State 2: like state 1 but windows are washed and bed is made.
    - State 3: like state 2 but floors are vacuumed and surfaces are dusted.
    - State 4: like state 3 but shopping is done so fridge is full and there is enough toilet paper.
    - State 5: like state 4, but there is more than enough toilet paper.

    Do not overthink or "over implement" this task! You need a main function where you control the state transitions (using setters). You need the str-method to print the state of the object (see that output prints (=str method) are informative, and it is easy to see the state of the object). E.g. "washing the windows" is done with setter setting the state of the windows data attribute.



2. You got so excited about your polished house/flat that you want to clean your car and change the tires as well. **Draw** a state diagram of that. Data attributes include e.g. tires (winter or summer tires), interiors vacuumed or dirty, car washed or dirty, tank full, empty or something in between (decides yourself). Use the same notation than used in task 1 (btw, it is drawn using power point). Do not use any colors or any funky elements in the diagram. (Code the diagram if you like, but this is not mandatory.)
3. After all the hard work of spring cleaning, it is time to bake some cookies. You can utilize the cookie class from Itslearning or you can challenge yourself and code it without taking a peek. **Implement the following flow diagram.** Do not overdo/-think or "over implement" it, it is supposed to be simple! You will manage with main function controlling the flow (and e.g. putting objects in a list etc.) and cookie class with setters, getters, init and str methods (and random flavor method). You can ask the favorite flavor from user (in main function). Bake and frost cookies one by one (let's assume you don't know at the beginning how many you need; however, for the sake of simplicity, we bake 10 (one by one)).



4. Go back to the alarm clock. What kind of state chart would describe your solution?
5. Continue with the “Countries and Capitals” quiz. Give the user a chance to test his/her knowledge with countries based on capitals.
6. BONUS, not mandatory: Take a look at the ready code in Itslearning (Animal, cat, dog, person, student and test class) and what it prints out. Change the code so that the test class works (so person can have a pet e.g. “Luffe” or “Garfield” and you are able to print out, which animal (e.g. cat or dog) that Luffe or Garfield is). So, modify the classes a bit (so that the print is not just object’s memory address, but which animal it actually is).